REMARKS/ARGUMENTS

Claims 1, 3-11, 15, 17-31 and 33-34 are active in this application, claims 2, 12-14, 16 and 32 having been cancelled. Claims 1 and 19 have been amended to specify that the present method requires that the drying step be performed at a temperature of from 50-100C and that the composite item retains the antimicrobial properties for at least 40 wash cycles. This amendment is supported by prior claims 16 and 33 and the specification at page 7, lines 21-23. No new matter has been added by these amendments.

The present invention relates to a method for providing antimicrobial properties to a composite material. The present method provides several important improvements and advantages compared to conventional methods for antimicrobial treatment.

(I). the present method provides the ability to complete the treatment using a drying process at temperatures of no more than 100C. This is a critical difference relative to the art. In particular, the methods for providing antimicrobial treatments described in the various references cited by the Examiner indicate that significantly higher temperatures are required to effect antimicrobial treatment on an article, with temperatures being typically on the order of 130C or higher. This is often followed by a heat treatment at even higher temperatures. That is NOT the case in the present invention. In fact, the present invention requires maintaining the temperature of the drying step to no more than 100C. In previous uses of the organic antimicrobial agent of the present invention, the drying temperature was required to be set at such a high level in order to effect reaction with water vapor (i.e. hydrolysis), followed by reaction with the surface of the article. Applicants have found that by maintaining the temperature at no more than 100C, it is still possible to dry the item, while permitting the antimicrobial agent to dry on the surface of the article, reacting NOT so much with the article's surface, but rather reacting primarily with itself to form essentially a coating on the surface. This coating provides the antimicrobial properties which are long lived.

(II). Further, because at the lower temperatures the reaction with itself is prevalent over the reaction of the antimicrobial agent with water vapor and the subsequent reaction with the article surface at the elevated temperatures of the prior art, the present invention provides the ability to treat essentially ANY surface, including surfaces such as glass.

(III). The present invention also provides the ability to reuse the spent treatment liquid to treat multiple items sequentially. Conventionally, when articles are treated for antimicrobial properties, the spent liquid has been discarded. That is not necessary with the present invention, as the spent liquid contains considerable quantities of the antimicrobial agent still present, and requires no special treatment of the spent liquid for its reuse.

The Examiner has rejected various combinations of claims over various combinations of references. However, since the present independent claims 1 and 19 now contain the limitations of original claim 16 and previously presented claim 33, only those rejections of claims including claims 16 and 33 will be addressed, as the Examiner has agreed that the other cited references (Rubin, Omura, Brier, Ohno, and Smith III, et al) do not disclose the required drying temperatures of no more than 100C as now required in the present claims. Applicants further note that the other steps in the present invention cannot be above this temperature as they are all aqueous bath steps.

The Examiner has rejected claims (including claim 16) based on the combination of Levy in view of Omura (or vice versa). Additionally, the Examiner has rejected claims (including claim 33) based on the combination of Levy in view of Smith III et al. However, these references when combined cannot result in the present invention. The Examiner's combination of Levy and Omura or Levy and Smith is based on a fallacy assumption. Namely, Levy discloses dry disposable polymeric products having sustained-release antimicrobial activity, which are provided the antimicrobial properties by bringing the polymeric material into contact with an amine salt antimicrobial agent, separating the solvent

from the treated material by soaking, evaporation, centrifugation and drying by the use of forced hot air, or other drying techniques, at temperatures up to 120C (with an example at 60C).

The Examiner then suggests that it would be obvious to use the antimicrobial agent of Omura or Smith in place of that of Levy in the process of Levy with the drying temperature of Levy. The fallacy of this assumption is that the antimicrobial agents of Omura and Smith are completely CHEMICALLY different from that of Levy. Each of Omura and Smith require that application of their antimicrobial agent must include drying and heat treatment at temperatures of 300-350F (approx. 148-177C) for Omura and temperatures of 320F (approx. 160C) and above for Smith (see column 4, lines 5-17). As noted above, these high temperatures were used by Omura and Smith in order to effect what was believed necessary for retention of the antimicrobial properties for such compounds, namely reaction with the surface of the fiber or article. Applicants have found, however, that antimicrobial properties can be provided on essentially any type of surface using the present invention organic antimicrobial agent with temperatures of no more than 100C, without the need to react with the surface being treated. The references cited by the Examiner cannot therefore result in the present invention being obvious, as one of ordinary skill would have no reason to expect that one could use the antimicrobial agents from Omura or Smith in the process of Levy and provide antimicrobial properties. The antimicrobial agents are too dissimilar chemically from that of Levy. Further, there would be no expectation that one could obtain antimicrobial properties that would last at least 40 wash cycles, since the use of such low drying temperatures would actually be expected to prevent the reaction believed necessary for the antimicrobial agents of Omura or Smith to work, namely their reaction with the surface being treates. Applicants have shown that is not the case, and have provided a way to obtain antimicrobial properties using a low temperature aqueous process that would permit the

treatment to be performed even in a household washer and dryer. To suggest that one of ordinary skill would expect such a result based on Levy, Omura and Smith is simply not based on any sound chemical reasoning and is purely hindsight on the part of the Examiner. As such, these rejections should be withdrawn.

Applicants submit that the application is in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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